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ABSTRACT

A change in focus of much of the work of the Society for General Systems Research for greater impact, relevance, and productivity is suggested. Tentative unit concepts for 23 areas of study or disciplines are explored. A unit concept is defined as the central, pivotal concept around which virtually all other basic concepts in a field revolve. The unit concepts employed in this paper focus on the mechanism(s) that explain the causes of change in the system under study in a global way. The presumption is that the basic problem of how order is possible is the central issue of any science. Alternatively, a more encompassing approach emphasizes the explanation of change in an individual (unit) in the face of conflict between two or more units under investigation. As a result, a deeper understanding of the structure of the units under study at two or more points in time is possible while still focusing on the mechanisms(s) by which the units change. What is accomplished is more than a mere static analysis of structure or hierarchy at only one or two points in time. (RSL)

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Carl Slawski

June 1986

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A UNIT CONCEPT FOR GST: "CHANGE IN RELATIONSHIPS"

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ABSTRACT

The aim of this paper will be to suggest a refocus of much of the work of the SGSR for greater impact, relevance, and productivity. We will suggest tentative unit concepts for about 23 areas of study or disciplines. A unit concept is the central, pivotal concept around which virtually all other basic concepts in a field revolve. The ones chosen here for comparison focus on the mechanism(s) that explain the causes of change in the system under study in a global way. This presumes that the basic problem of how order is possible is the central issue of any science. A more encompassing way to look at this is to ask how to explain change in an individual (unit) in the face of conflict between the two or more units under investigation. The answer implies an understanding in depth of the structure of the units under study at two or more points in time, yet focusing on the mechanism(s) by which the units change. It is thus not a mere static analysis (of structure or hierarchy at only one or two points in time). A unit concept provides a watchword for future work in the subject matter area.

INTRODUCTION AND DEFINITIONS

A unit concept is the central, pivotal concept around which virtually all other basic concepts in a field revolve. It is the "smallest observable meaningful" unit (F. Adler) of behavior of the concrete entity or system under investigation. For the life and social sciences it refers to the basic behavioral unit of any of the J. G. Miller's eight Living Systems. Use of such concepts is parsimonious, helps to accurately define the boundaries of the discipline, and makes for more openness to investigation because it refers to observable reality (F. Adler 1964: 362). The behavior item is distinguished from those "particles" or elements of behavior which only in a given context or cluster of items signal differences of meaning [a notion interpolated from F. Adler (1960: 359)]. The aim of the use of unit concepts, depending on one's discipline, profession, or specific application, is to focus the thinker's attention, and to give it direction toward a more comprehensive overview of the subject, a more symphonic composition, a more nearly deductive or axiomatically stated theory, or a richer picture.

Use of unit concepts addresses the problems of information overload and cacophany of verbiage in the Tower of Babel within the not-so-neat academic and professional

disciplines. It especially zeroes in on the mediation of academic infighting that might be better directed at negotiating differences or demonstrating their complementarity rather than at sterile criticism. These are problems most characteristic of multiple-paradigm sciences, not to mention the humanities or even the plethora of psychotherapies. It is certainly a major problem in much of the social sciences, but also in the practitioner's trade, in the professional's concerns, and in the artist/humanist's productions. Use of broadly framed unit concepts then involves "limited reduction" (as per the sociologist, Guy Swanson, 1965), but not to the point of normally objectionable or positivistic oversimplification. It should also promote cross-disciplinary comparisons in the interests of enhancing General Systems Theories.

A working definition of a universal, i.e., multi-disciplinary, unit concept is "change in relationships." This notion is both more comprehensive, more intrinsically dynamic, and more suggestive or heuristic than the more traditional key (Hobbesian) focus on how social order is possible. For certain it moves us beyond the static analyses of structuralist or even functionalist emphases on a whole unit at one or two points in time. In effect it advances us to the tool manipulation level of the motion picture rather than the still photograph alone. It may also direct us to think more explicitly about how to predict and prevent problems rather than to describe them purely, at arms length, from the arm chair alone, in the mode of the ultimate, value-free, detached voyeur. The cybernetic pace of change of modern times in fact demands that we develop more responsive, scientific, artistic, and professional handles than could ever be provided by snapshots alone of single, whole entities.

The aim of this paper will seek to redirect our thinking away from passive structures or subsystems or slowly evolving hierarchies of elements in semi-closed systems. The hope is then to simultaneously highlight the more relevant and productive focus on unit concepts emphasizing change or interaction in relationships.

Taxonomies will be introduced 1) to cross classify specific theories or unit concepts by their patterning of bonds vs. style or pace of change; 2) to classify change processes (from static to dynamic) by scope (micro to supra-system levels); 3) to examine the focus of patterning of systemic processes at various levels from micro interaction to macro system. Contrast will be made of components of structure vs. process or change elements, followed by a highlighting of the relatively static or passive structures in Miller's nineteen living subsystems as opposed to the truly change oriented subsystems. This will suggest some adaptations or redefinitions of his subsystem labels in order to direct the researcher's attention more directly toward the dynamic or change oriented elements in Living Systems.

VARIETIES OF FOCI AROUND "CHANGE"

A kind of thesaurus will be developed here around the concept of "change" and process. Along the way, some nuggets and steppingstones will be located, leading to some tentative taxonomies that will hopefully result in a fruitful direction for future research and synthesis of concepts across numerous academic and professional disciplines.

Mortimer Adler's Syntopicon represents a cross-classification scheme for the basic concepts that are discussed in various ways in the series known as the Great Books of the Western World. The most relevant concepts discussed in separate chapters in the Syntopicon that apply to the focus of the present paper are cause, time, progress, and revolution, in addition to a chapter on our main focus, namely, change itself. Since the Great Books series deals with historical classics and works of philosophy and science the way the terms are treated is vaguer and fuzzier than most concepts of modern social science since the latter are now oriented toward operational indices and even quantitative measurements. However it is useful for perspective to begin with the days of pre-social science.

Within the Syntopicon's chapter on change, we are reminded that Aristotle discussed change in his physical treatises in terms of four kinds. They are change in quantity (involving growth and diminution), change in place (involving only motion), change in quality (involving alteration), and change in the form of "coming to be" or "passing away," (or alternately, "generation" and "corruption" or "becoming" and "perishing"). The first three, seen as kinds of motion, he calls accidental or attributional change as opposed to substantive change. Various critiques of this typology include that of Descartes who notes the vagueness of Aristotle's terms potency and actualization. Locke sees as absurd the idea that motion or change necessarily involves a potentiality capable of progressive fulfillment (M. Adler, 1952: 195-197). Adler concludes with the comment that "Change is not only a factor in the analysis of emotion, but it is also itself an object of man's emotional attitudes. It is both loved and hated, sought and avoided" (p. 200).

If we may jump to modern times we can see the continuing failure to come to a precise understanding of the causes of physical change except for example in a general way through a greater understanding of the biological genes through the medium of the recently discovered structure of DNA. Certainly there have been great engineering feats in the physical realm. But the lack of agreement even after the massive work on MDSO in trying to define mental illnesses remains for purposes of professional practice a virtual failure. The almost innumerable varieties of psychotherapies (including the paradigms of psychanalysis, the rational-emotive, client-centered, behavior modification, gestalt and group encounter) indicates that some

breakthroughs are needed in order to synthesize modern social science and practice.

Even if we take what this author lists as the key concepts that constitute the essentials of sociology, it is obvious that more synthesizing work needs to be done. Included in the list of key sociological concepts are norms, roles, values, group integration, social and cultural organization, social class, bureaucracy, empathy, self control, sentiments, definition of the situation, careers, accommodation, dialectic, the social act, the reflective act, exchange, power, conflict, social functions, and social control. Some sociologists like Franz Adler (1960), and in a slightly different way, George Homans (1967), following in the footsteps of B. F. Skinner, tried to reduce this wide variety of concepts to unit acts of observable behavior. The success of their reductionist orientation in generating monumental, let alone giant steps forward in the direction of greater holistic synthesis has in this author's opinion been minimal. Even the abortive attempts to develop axiomatic theories (such as by Clark Hull in psychology, and the push toward deductive theories by Homans in sociology) have ended in de facto rejection by the vast majority of social scientists. The exigencies of research grantsmanship and quantification have restricted research hypotheses to two or three variables at a time, leading inevitably to neglect of the broad picture by the majority of researchers in social science, education, and professional practice. A separate movement toward use of case studies and ethnographies or qualitative research has been a weight on the other side of the balance, but not nearly enough to counteract the longstanding positivistic orientation of the social sciences. A closer look at the single octopus-like field of sociology might shed some light on the need for a unit concept in general, and one that stresses change in particular.

Even when we look at the major figures or schools of thought within the multiple-paradigm science of sociology we see a general lack of much theoretical progress since the 1960's exemplified by the debates between the Homans type of behaviorism and the Parsons type of structural functionalism. The activist orientation of the Marxists has been interesting, and the micro-interactional focus of the ethnomethodologists have been thoughtful. But even the Frankfurt School has gotten bound up in its own abstractions, if not in a certain cliquishness or cultism. We have seen, for example, the continuing work in the traditions of Durkheim, including that of R. Merton and Parsons along analytical lines focusing on rates of behavior and social rank. There is the separate line of thought curious about discrepant roles and manners in the dramaturgical tradition of Goffman, continued along newer directions by Garfinkel and his followers in their ethnomethodological analyses, in turn pushing toward more penetrating hypotheses about interpersonal communication. The exchange theorists like the

micro-oriented Homans and the more macro-oriented Blau have studied social patterns and individual and group behaviors. Some have continued in the tradition of Max Weber to develop ideal types to describe social behaviors in order to better interpret them through "verstehen" analysis. The Marxists have continued their macro studies of social class and culture conflict often at the extremely high level of abstraction of the Frankfurt school. Finally, the need for some more general synthesis is called for saliently by G. Ritzer in his book, Sociology: The Multiple Paradigm Science, 1975. He makes a good case that the six or seven common theories in sociology can be seen in broader scope in terms of three major paradigms, those of social factism, behaviorism, and definitionism. But even with these emphases, he does not provide us with a set of concepts that might help us to unify even these three groups of theories.

It is left for the present author to suggest that the present unit concept, "change in relationships," focuses on relationships and thus on rates of behavior in a way that can begin to satisfy the main emphasis of the social factist orientation to group structure and integration. Relationships between social classes and societies depend on relationships between individual persons acting in roles or societal patterns. Thus the unit concept touches base with the Marxist or conflict orientation. Though the behaviorists would like to look only at individual or group behavioral units, they have to admit that human behavior is always the behavior of individual persons attempting to pragmatically satisfy their own needs and enact or create new roles in their subgroup or culture. And future actions of individuals depend on the reaction of society and the observed effect on their own social system or environment. This in turn depends upon how the social actors define their situation as it arises and continually changes through the course of a time period or career. Feedback received from significant other persons as well as the actor's understanding of his effect on his groups and subsociety is the central concept of definitionism. Thus we can fairly readily see the connection between "change in relationships" and the main paradigms of sociology, behaviorism, social factism, and definitionism.

While a case could be made that some other unit concepts might serve just as well, such as social order or the social act, it can at least intuitively be seen that "social order" takes as a given the status quo. In contrast, "the social act" assumes that the single individual actor in interaction with one other is the prior and necessary building block. Whereas, the notion of "change in relationships" directly incorporates the idea of two or more actors or groups or societies in a moving equilibrium or transitory stage in the continually emerging social order. This focus on change is partly implied by the unit concept of the social act. An interacting other person is also implicit. But it does not as directly or holistically capture the sense of the modern-day, cybernetic pace of change in technology,

including the variety of human potential fads and fashions that come and go at group and societal levels in ways that help us deal with the stress of rapidly changing modern careers and accompanying social life.

Even before we focus on a particular unit concept, another way to begin to organize our thpughts and diverse concepts i to use taxonomies. After a couple of decades of testing and revision, the present author has evolved such a tool. It will presently be introduced. But let us first advance a number of synonyms and components of change and process and the contraries or particles or structures. In general we will contrast some aspects or equivalents to "structure or function" on the one hand, to "process or change" on the other. Under each of the main notions, we will look first a concrete entities and secondly at abstract entities. Under the heading of "structure or functions" the concrete entitie may be observed as pattern, form of unitary bodies, or information form. Forms of information occur in networks. But the concrete pattern occurs in the form of a momentarily stable, concrete entity. We then can develop or perceive a picture, silhouette, image, percept, or metaphor for the phenomenon. Structures involve complexes of behavior, or consequences of such behaviors. But functions are not generally causally explained as to their direct causal mechanisms. In other words, functionalists typically do not give detailed illustrations, descriptions, or explanations o why the behavior at time-1 (or the "before situation") results in certain global effects on the system as a whole a time-2 (or the "after situation") through the use of step by step causal mechanisms of change.

The abstract entities or hypothetical constructs that form structures include personality needs or impulses to act, including the human self concept composed of a tendency or pattern of gesturing or significant symbolization. It will be noted that both the concrete and abstract entities mentioned under structure or functions refer to the subject matter or object of study as a unit, or to a behavioral situation at only one, or at most two, points in time.

Under "process or change" we are first directed to see a number of concrete entities, namely, the sequence of events, alteration in the entity itself, movement in stages, steps c time periods, as well as information flow. We of course observe activity per se, action or interaction, sometimes viewed as goal-directed "conduct." Within the latter frame of observation, we may see information enriching clusters of activity which could alternately be seen as negentropic movement or progressive organization of the particles or subparts of the primary object of our study.

In studying human behavior in this way, we observe much more than the tropism of biological cells. Rather we intuitively grasp or infer the complex clusters of activity we call perceiving or even imagining on the part of our

acting subject. Our subject in turn may imagine him/her planning future behavior or future types of interaction. infer such activity through our use of hypothetical constructs such as the mind, the self concept, role-taki empathy, and the internalized conversation of gestures k as the I-Me process, the self-control or conscience mechanisms unique to rational human beings.

Only through the use of such hypothetical constructs c infer causal mechanisms, especially those that are prima logical or reasonable or sentimentally motivated actions. Thus we have a starting point for considering various as of process or change in concrete, dynamic systems as opp to static structures or functions in equilibrium. Notice that in order to achieve the most complete description of concrete systems we had to bring in the use of hypothetic constructs. Having seen some synonyms and components of process or change in concrete entities, let us turn to a consideration of process or change in abstract systems.

Abstract systems are by definition hypothetical, but nonetheless extremely useful if not essential notions for enterprise of understanding human reality. Even the conc of personality or culture are abstract and not concrete, it would be difficult indeed to discuss social groupings without such abstract concepts. Some types of abstract systems indeed include procedures, techniques or methods behavior, sequential statements of how to change a concre activity system, or of how a dialectical synthesis of globally competing macro-systemic components will come in existence or evolve itself into some new evolutionary synthetic whole. The latter is the notion of synergy. I may of course operate not only on physical material or biological beings, but on mental capacities such as the underlying common mental atitudes and values presumed for example in any social institution such as the systems of education, the economy, law, government, religion, and in such landmark documents as the Bill of Rights attached to United States Constitution, or the United Nations Declara on Human Rights. There is implied in these kinds of abst systems a kind of group mind or atmosphere or culture, a notion surely essential to a full and holistic understandi of human social reality.

POLARITIES OF CHANGE

Let us hark back here to The Fundamental Forms of Social Thought (to the work of W. Stark, 1963, who summarized all major schools of social thought throughout history under three types, organist, mechanicist, or process thinking). Taking our cue from this seminal work, it might be instructive at this juncture to consider some ideal types polar opposites, pro and con change, static vs. dynamic, considering the status quo as the neutral or mid-point on scales. We will do this at four different levels of syste process, namely, at the micro, intermediary, macro, and

supra-system levels. The micro processes occur between elements, at the level of direct exchange, where strategy or tactics or immediate feedback comes into play. The polarities could be seen here as MELDING (meeting of the elements, agreeing or merging or resolving of differences, or compartmentalization of subelements), as opposed to COLLISION (of particles, juxtaposing, expressing differences, choosing a line of action, or assertively giving something to another). The neutral point at this level would be DETACHMENT (or inactivity, neglect, indifference, ignoring, mere acceptance or receiving of something).

At the intermediary level of consideration we can consider conduct or movement of the elements as ranging from the processes of INTEGRATING (accommodating, optimizing, evolving, or making symmetric) to the processes of DISINTEGRATING (opposing, atomizing, or devolving). The neutral point would be DIFFERENTIATING (including the notions of emerging, perhaps through space; diffusing, specializing or generalizing of parts, or aspects, and in general the patterning of processes without a definite or clear direction yet observable).

At the macro level we can consider processes that lead to some predestined teleological order, or those global processes characterized by increasing information but not necessarily guided by some higher power or godlike hand which have come to be known as teleonomic systems. The extremes here range from EQUILIBRATING (hierarchicalization, balancing, removing the asymmetry) to GLOBAL CONFLICT (ranging from antithesis to synthesis, entropy to negentropy, promotion to resolution of conflict). The neutral point is one of CYCLICAL PROCESS (including movement of a dynamic structure, rise-and-fall historical patterns, and dialectical harmonic alternation).

At the suprasystem level we consider such notions as international or metatheoretical or metasystemic activity states or processes. These range from CLOSED to OPEN system situations. Neutral here would involve the ongoing interplay of ultra-large system patterning, MUTUAL EXCHANGE OF INFORMATION AND ENERGY, ecosystemic recycling, or valuing at the level of global collectivities and cognitive networks of thought patterns.

In reality, there is always influence of the suprasystem processes on the next lower level and in turn influence on the intermediary and micro processes, as well as vice versa. These opposite processes occur at least if there is a self energizing, or "willful" unit at the micro level capable in some sense of original or creative activity, especially if it is of a self-conscious nature. In sociological terms, the supranational system and world synergic processes influence nations that influence international, societal, community, and organizational relations, that in turn influence interpersonal, even friendship relationships. The converse

is also true. Interpersonal relations, especially of influential persons, affects group and organizational and community relations, which in turn affect the tenor of global social interaction, and finally affect the thought processes affecting international and may perhaps affect interplanetary societal relations in the distant future.

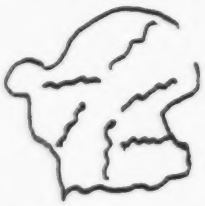
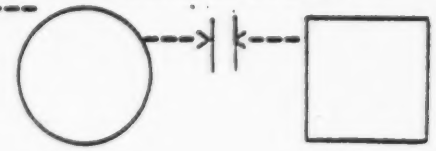
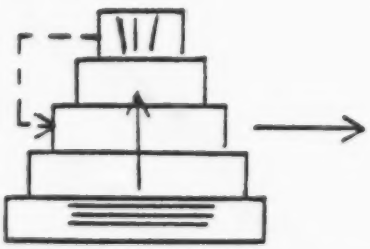
FOCUSING CHANGE IMAGES

Having seen many varieties and polarities dealing with the concept of change, it behooves us now to zoom in a bit closer to a graphic synthesis of some more intuitive representations of these diverse elaborations. DIAGRAM I, "Patterning of Systemic Processes," suggests a view of the basic or fundamental forms of systemic thought beginning with the most global notions of looking at the polarities of the WHOLE vs. the ELEMENTS, with FLUX or process itself at the neutral or midpoint between them. Parallel to this triadic polarity, at the level of <u>interaction</u> between elements, we can visualize the processes of MELDING vs. COLLISION, with some combination of fusion and fission or perhaps ABRASION at the midpoint. At the level of consideration <u>within</u> the whole, we could look at the processes of INTEGRATING vs. DISINTEGRATING, with a sort of residue production and product distribution or SIFTING process going on at the midpoint. Then we could look at the <u>macro</u> system level to see the processes of EQUILIBRATING vs. GLOBAL CONFLICT, with a kind of peace and war occurring simultaneously at the midpoint, in a quasi-SYMBIOTIC fashioning process.

In order to arrange our images of the central unit process it will be useful to conceive of it in terms of a hierarchy of elements representing the focus of study in the separate discipline or profession. It could for example represent the structure of personality or the structure of the chemical elements or the varieties of botanic life, or the importance of the separate recommendations in the organization theory, say theory X, Y or Z. This ladder or hierarchy must then be drawn in relation to a second hierarchy representing the other element, be it person or molecule or cluster of components. This may be seen in DIAGRAM II, where the parallel lines in between the two interacting units represent the gap or chasm that distinguishes them as separate units. The arrows from each whole pointing in the direction of the other represent the encoding process or attempts to communicate. The arrows leading from the chasm of parallel lines to the other unit represent the process of decoding or receiving or interpreting the message at that point.

The similar set of two units, A and B just below the top set represent the same pair of acting wholes in interaction with one another at a second or later point in time. There will inevitably be changes in the hierarchical structure of each whole, A and B, as well as in the relational dyadic unit per se at each later point in time. These changes are represented either by the accidental differences in the

Diagram I: PATTERNING OF SYSTEMIC PROCESSES

	WHOLE	FLUX	ELEMENTS
Basic FORMS of Systemic Thought:			
INTERACTION Between Elements:	MELDING ----------> <----------		COLLISION -----> <-----
Within Whole:	INTEGRATING ----------> <----------		DISINTEGRATING
			
MACRO-System:	EQUILIBRATING ----------> <----------		GLOBAL CONFLICT
			
Hierarchies in temporal stages:			

These patterns apply at the levels of atomic reactions, as well as in each of the levels of Living System: cell, organ, organism (including the human one), group, organization, community, society, and supra-national.

Diagram II: CHANGE IN A RELATIONSHIP

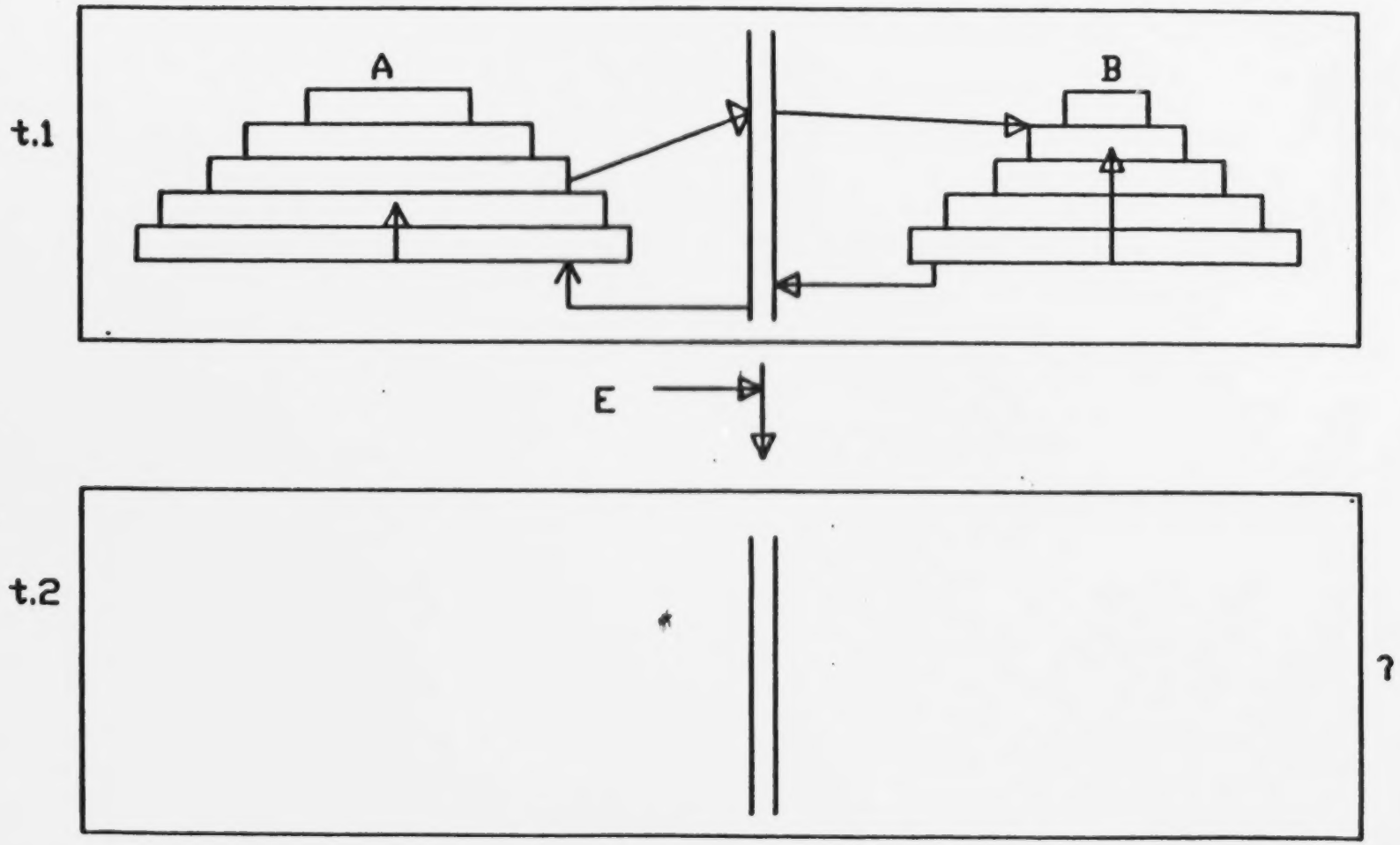


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diagram or left up to the imagination of the reader. The arrows within each ladder or hierarchy or whole unit represent changes within or feedback from one subelement to another within the basic whole. The arrow from the top to the bottom rectangle represents change over time, in this case from t.1 to t.2. The E stands for an EVENT that marks the change, either causal or symbolic, in the relationship of separate wholes, either in A or in B, or in the A-B relationship or cluster. The arrow from the E to the vertical, downward-pointing time arrow represents only the point in time when this buoy, or steppingstone or turning point is observed.

MAIN TYPOLOGY

Having seen a variety of types and polarities, we shall now look at the main typology, DIAGRAM III, entitled "Changing Bonds." It is a very broad typology that encompasses virtually all possible views on the question of changing bonds. Although it was developed with regard to sociological theories, it can indeed be applied to any discipline that can be conceived with the unit concept of changing relationships. It would seem evident that "changing relationships" encompasses all disciplines amenable to systematic study. The concept deals directly with bonds or relationships. A relationship in turn is defined as the probability that future interaction will occur between the two or more units, elements, components, atoms, molecules, cells, organs, plants, animals, persons, groups, communities, societies, nations, or supranational systems.

The variable across the top is STYLE, including source and/or pace of CHANGE over time. The subcategories increase from left to right, in pace of change, from equilibrium theories to evolutionary to rise-and fall (cyclical or dialectic), to the fastest pace of change in conflict theories. Theories also vary according to the dimension at the left, the PATTERN OF BONDS between the elements or whole units or relationships (such as occurs in social science regarding the bonds between social persons or personalities) in a SITUATION at one point in time. These bonding patterns may be focused upon empasizing in turn the PARTICLES, the SPACE or territory in which the bonds likely occur, the ORGANIC whole units or relationships, or the FLUX or processes that occur between and among the whole units or the bonds themselves. The only one of these dimensions that per se focuses on change is of course the flux or process pattern.

Within any cell or set of cells one may place any given type of theoretical model one wishes. In order to do this one ought first to consider whether one is thinking of the theory as representing either 1) the typical behavior of particles or relationships, 2) their actual behavior, or 3) the implied behavior of the units as interpreted by you or the primary scientist or consultant. It also is worth some

Diagram III:
TAXONOMY OF THEORETICAL APPROACHES TO
"CHANGING BONDS"

STYLE (Source and/or Pace) of CHANGE (over time)
[The pace generally increases from left to right.]

		Equili-brium	Evolu-tionary	Rise-and-Fall	Conflict
PATTERN OF BONDS Between WHOLES or RELATION-SHIPS in a SITUATION at one point in time.	PARTICLE				
	SPACE				
	ORGANIC				
	FLUX= PROCESS				

The occurrence of either style or pattern of bonds may be either 1) typical, 2) actual, or 3) implied. A given theory may also overlap two or more cells at the same time.

consideration that change in either of the four styles (across the top of the chart) may as well involve the four aspects of Aristotle, namely, change in terms of quantity, place, quality, or coming to be. Furthermore, relatively speaking, depending on one's global focus, the style of change could be analyzed at either of the four levels, namely, in terms of micro processes, intermediary, macro, or supra-system levels. However the evolutionary and rise-and-fall approaches are generally referred to long-term historical change.

It should also be noted that any theory, paradigm or meta-theory may fall within a combination of cells. Thus for example let us look briefly at the three paradigms of sociology (noted by Ritzer). Social Factism tends to emphasize equilibrium and evolutionary styles of change, and largely flux, but to some extent organic patterning of the bonds. Thus, Social Factism falls mainly into columns one and two, and mainly in row four, but also somewhat or sometimes in row three. Behaviorism de facto if not de jure tends to focus on the particles and spaces, though sometimes on flux, and nearly always on equilibrium, or perhaps on how to change units or persons to achieve states of equilibrium. In other words, Behaviorism usually falls into column one and row one and two, and sometimes row four. Definitionism tends to focus on the organic and flux patterns, but on the conflict or rise-and-fall styles of change, i.e., in rows three and four, and columns three and four. The reader is invited to attempt to place the theories of his/her own discipline into this typology in order to compare similarities and differences with these sociological speculations. Naturally any more specific and narrow theory, such as exchange theory or structuralism or interactionism, or Marxian conflict theory could be separately placed in ways that would be somewhat different than the more global paradigm of which they are one manifestation.

STRUCTURAL BIAS IMPLICIT IN THE 19 "LIVING" SUBSYSTEMS

It is with some irony that we refer to living subsystems since one could say that Miller's "Living Systems" are whole concrete units but the subsystems are as often abstract systems with no direct physical referent. This tends to spoil Miller's insistence that he is focusing only on concrete systems. Where for example is the concrete referent in the human person to the associator, converter, or decider functions, let alone to the encoder and decoder functions? Brain research has shown that if one part of the brain is damaged, often enough another part takes over where the original part ceases to function. Thus it would seem that the nineteen subsystems said to function within each of his eight whole living systems are not themselves referrable to a single organ or part of an organ within the plant or animal, especially in the more complex animals like the human being.

The main point to be introduced here is what seems to be a de facto, though not a de jure bias in Miller's scheme of Living Systems and subsystems. It is a bias towards structural or at most functional units or components, rather than toward process and change per se. This may in part be due to his necessary dependence on the data banks of prior research and theorizing, which even into the cybernetic age, have emphasized relatively static hypotheses. This is also true in the social sciences even though they above all ought to emphasize ongoing process and rapidly evolving behavioral change, because they deal, for example, with phenomena of collective behavior, crowds, electorates, publics, social movements, or relationships in conflict or crisis, or ambiguous situations of any kind.

In particular, it should be noted that "structural" implies a static state of being, a passive medium, one that is limited or frozen in a pattern at one point in time. Structural involves an automatic functioning at best, one that involves the same structure as cause of certain effects, or that acts at one point in time in such a way that it produces certain functional outcomes that lead to the survival or demise of the whole system or cluster of units. This kind of functioning is mechanistic, autonomic, consisting of involuntary activity. It is limited or environmentally bounded, motoric, involving a repetitious patterning of a set of actions. It may portray mechanistic agency, a mere state of being, a picture of a situation at only one point in time.

The "functional" component introduces the second point in time wherein the consequences of a set of conditions or actions produce an effect on the system as a whole. But the concept of "function" and its use almost always fails to describe the sequence of events in between "time 1" (t.1), and "time 2" (t.2), and even less often fails to <u>explain</u> <u>why</u> there is change in terms of social and interactional mechanisms at the micro or interpersonal level of understanding. The emphasis in Miller's work thus appears to emphasize the structural and at best the functional modes of thinking, at least by implication of the kinds of research he cites and the "organic unit in space" type of "equilibrium" orientation that his major typology strongly implies. This is certainly true in the social scientific chapters. He takes a de facto traditional, perhaps even a curious and interested but relatively laissez-faire attitude toward the kinds of research being done in fields outside the social sciences. It seems that his Living Systems typology is quite valuable as a stepppingstone or trail marker pointing toward the need for verifiable quantitative, cross level hypotheses. However, this writer would like to see him promote, or even better, actually do some either qualitative or quantitative research of a cross level nature that is a model of how to incorporate change and process in research projects on the nature of ongoing relationships, particularly

in the more abstract realms of psychology, anthropology, sociology, and political science.

For sure, the traditional emphasis in most social sciences has been on structural or functional theories and hypotheses, which almost by definition focus on equilibrium, the slowest pace of change, and on organic or perhaps space models, that tend not to emphasize change in the bonds or relationships between whole acting units. The alternative is to begin to systematically emphasize research on change and process. This denotes active movement in a sequence of stages, especially (at least in the social sciences) voluntary conduct, or the seeking of conscious, intended ends or aims of activity. Process plays up self-regenerating interaction. Research and observation in this realm would employ multi-step methods or procedures, or techniques. It also ranges from a focus on short-term adjustment of units to swift transformation of the whole complex, the whole system at issue. It stresses causal activities or interactions, even self-regenerating sentimental patterns or cultural values. It would employ a multi-frame, continuous set of images in constant flux, but with occasional hovering or quivering at nodes or instants of apparent rest and regeneration.

To become more specific we will now attempt to constructively criticize Miller's monumental work with a view toward redirecting its de facto focus toward a more thorough-going and pervasive emphasis on change and process. One way to do this would be to begin to rename his nineteen subsystems, changing their names away from the implicitly relatively static or passive structures serving some function more or less automatically. A primary reason for this renaming, in the social sciences, for example, would be to allow us to more accurately and richly portray and take into account the use of complex higher functions such as are required in the uniquely human mental processes known as role taking or empathyor forming one's self concept, or coming to some relatively unique definition of the situation and on that basis selecting out the best plan of future action. In this vein, we could rename Miller's terms with the -ion or -ing endings that would more directly urge us to focus on the notions of process and change, or at least continuous activity and interaction. We could rename "matter-energy storage" as STORING; "memory" as REMEMBERING; "boundary" as SETTING LIMITS; "motor" as MOVING; "distributor" as DISTRIBUTING; "supporter" as SUPPORTING; "encoder" as ENCODING; "channel and net" as CHANNELING AND NETWORKING; "internal transducer" as INTERNAL TRANSDUCING; "input transducer" as INPUT TRANSDUCING; "ingestor" as INGESTING; "output transducer" as OUTPUT TRANSDUCING; "distributor" as DISTRIBUTING; "extruder" as EXTRUDING.

Among the nineteen subsystems there are four that are already very directly change-oriented subsystems, but even

these could be renamed for emphasis as follows: Call the "decider" subsystem the DECIDING process; the "associator" the ASSOCIATING process; the "converter" the CONVERTING process; and the "producer" the PRODUCING process. Among other advantages of this renaming would be its redirection of efforts away from finding measurable structures or substructural elements that serve the nineteen functions. This would facilitate placing our emphasis on explaining change in the units or relationships regardless of whether they are conceived of as concrete systems or whether we temporarily describe them in abstract terms or with hypothetical constructs. Such constructs may advance us more quickly to an understanding of the underlying issues, namely, of explaining change over time. This is more of a problem in the social sciences where there is less likelihood of finding a quantifiable referent to the subsystems or what I would prefer to call the subprocesses. The physical or biological sciences may be able to maintain the bias toward quantification, but the concepts of empathy or social perception, being unique to the human species, is the major emergent concept that puts the study of social relations at a new and qualitatively more complex and thus much-less-easily quantifiable level of understanding. Many discussions in the philosophy of the social sciences have considered this problem, and all but the positivists have seen that the study of social relations require a greater variety of tools and more openness to the definitive case study and participant observation as examples of not only legitimate but even superior kinds of research that highlight and play up the use of qualitative methods of study.

The main goal of this renaming then is to play up the process over the structure or functions that emphasize primarily one or at most two points in time in our research hypotheses. It should help us to incorporate multiple points in time explicitly without forcing us to give up the emphasis on the valuable cross-level nature of our hypotheses and theories, even and especially in the social sciences.

UNIT CONCEPTS FOR MANY DISCIPLINES

Following along this same line of thinking, it may not be altogether out of place to suggest an alternate name for the Society for General Systems Research. If this writer were permittted to rename the society with a view to promoting more change oriented research, it would be named the Research Association for Systemic Change and Interaction Processes (RASCIP).

As discussed above, a unit concept is the central, pivotal concept around which virtually all other basic concepts in a field revolve. The ones chosen here and stated below for comparison focus on the mechanism(s) that explain the causes of change in the system under study in a global way. This presumes that the basic problem of how order is possible is the central issue of any science or humanistic or

professional discipline. A more encompassing way to look at this is to ask how to explain change in an individual (unit) in the face of conflict between the two or more units under investigation. The answer implies an understanding in depth of the structure of the units under study at two or more points in time, yet focusing on the mechanism(s) by which the units change. It is thus not a mere static analysis (of structure or hierarchy or function, at only one point in time). It does not refer to an abstract system or organism per se, not to subsystems, but to mutual influence interactions or relationships between two or more concrete, whole units or systems simultaneously considered. Finally, it is hoped that the unit concepts suggested here will provide watchwords for future work in the various subject matter areas.

Before giving a systematic list, a number of more or less unclassifiable possible unit concepts will be suggested in order to brainstorm and free up the reader's imagination. They are: the double integral (the logo of the SGSR, also symbolizing in calculus not just velocity, but change in velocity, otherwise known as acceleration); synergetic holonomy; alternating parallel patterned processes, emergent helixes; dialectical accommodation; resolution of polarities; explanatory architecting; negentropic interaction of elements; the dynamic of comparable structure building activities; isomorphic interdependence of particles in the whole; mechanisms of growth and change; conflict negotiation; anatomy of relation; decisions for conversion; variegation or elaboration process; synergic traverse to a higher collective thought mode, namely, synergy, induced by a critical mass of devotees. Finally, we come to our systematic, suggestive list of unit concepts for a wide range of discplines, humanistic, scientific, and professional.

Note the meaning of the following symbols:

(-) = Numbers in parentheses in left column refer to J. G. Miller's seven Living Systems.
* = The items starred before the definition column or statement indicate the most crucial and central or insightful definitions or areas for study in the opinion of this author.

AREA OF STUDY:	"UNIT CONCEPT" TO EXPLAIN CHANGE:
Chemistry	*Reaction between combined elements or molecules. Fusion, fission, explosion, implosion.
Physics	Matter-energy transformation and use via laws and/or physical intervention; neg-/entropy.
Engineering	Pragmatic design and development procedures.

Ecology	Appropriateness of energy recycling (i bio-physical-chemical-social) mechanisms or interlocking processes.
Biology (1) cell (2) organ	Survival of fittest; genetic code; DNA generating biochemical interaction. Adequacy of environmental resources to facilitate growth or equilibrium.

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[The study of human systems is vastly different from the study of the hard or other natural sciences, very different even from the study of lower animals (including primates and porpoises), based in part on the human's possession of a much more complex CNS, especially the cerebral cortex, which allows the occurrence of such well developed processes as empathy for fellow humans and a highly developed self concept, self conscious conduct, as well as an orientation toward distant future or idealistic goals or ends. It is at this level of analysis that "group variables" emerge, i.e., syntality variables as opposed to population or structural variables (Cattell, 1948), which are not reducible to a mere summation of variables at a lower level of analysis. See also R. Merton's "Provisional List of Group Properties (195_?).]

Economics/ Business	Alteration of resource base insofar as it influences monetary exchange and cycles.
Psychology (3) organism	Reaction to stimuli; reinforcement of responses; mental association; imitation.
Psycho- therapy	Need for consistent self concept, reduction of stress or dissonance; curiosity; drive toward companionship.
Anthropology	Accommodation of values or sentiments; innovation within or across subcultures. Teleology of function fulfilling, or dialectic of planned or unplanned alteration of relationships or social structures.
Social- Psychology (4) group	*The reflective social transaction. Selection of most pragmatic image (or plan of action via the "I-Me" internalized conversation of gestures) that becomes a new need. The gesturing, role-taking process (aimed at consensus and institution building).
Sociology (5) society	Role-making which alters social structure in terms of roles, combined from norms, based on values, and built into a structure of the collectivity. External or internal failure, or

	alteration of a social institution, viz., the economy, polity, education, family, law, or religion.
Family	Procreation; transitions or crises altering kinship bonds or networks.
Politics	Representative governing decision and its implementation.
Law	Wise, reasoned judgment on negotiated findings of fact.
Education	The stimulating learning relationship, guided by organizational influences and the socio-intellectual atmosphere.
Organization (6)	Manager's decision (on policy, goals and implementation in context of the service or manufacturing process or product market (supply and demand).
Supra-National (7)	Diplomatic negotiation. Initiatives and education via cooperative multinational associations. Or warlike, aggressive acts and policies. Alterations in the natural and social resource base and/or distribution channels. Or the dialectic of difference resolution.
Global Issues	The influential, integrative initiative.
* *	* * * *
Philoso-phical	Axiomatic argument offering new truth or wisdom.
Mathematics	Novel proof or a new theorem.
Literature	Well-crafted sentence(s).
Art	Effectively communicative image or symbol or dramatic interaction.
* *	* * * *
Living Systems	Associator, controller, especially decider function, component or agent at each of the 7 (or now 8) levels.

Inter-sub-Systems (in general)	The agent that changes the holon (depending on subject matter).
Across many theories:	*The dynamic, interactive, asymmetric, binary relationship (suggested in oral session by J. Salk at the 1985 annual meetings of the SGSR).

SIGNIFICANCE OF UNIT CONCEPTS

The last unit concept, listed above, designated as applying "across many theories," was stated in a general question-and-answer session of distinguished panelists at the 1985 meetings of the SGSR by Jonas Salk as his recently thought out unit concept. It is in full agreement, and nearly coincidental with the present author's "change in relationships." Salk's is a bit more specific since it refers to asymmetry, and makes explicit the "interaction" implied in the briefer concept of "change in relationships." In any case, Salk's definition is a most cogent one and worthy of serious consideration as a tool for promoting synthesis of the virtually unlimited number of disciplines examined by General Systems theorists.

This kind of simplification around generally agreed-upon single concepts certainly will make it easier for understanding and cooperation to come about between scholars and professionals from a variety of disciplines. This is so because such concepts are easy to apply. They give direction to our descriptions as well as to our informative and exploratory investigations. They give more guidance than long lists of concepts, as necessary as these lists may be for the long-range enterprise of synthesis. The particular phraseology chosen here can be used to guide us to focus on change and thus on prediction of change in units as well as on change in relationships between units. Finally, the centrality of such a concept and its universality of applicability gives us a serious basis for global synthesis and explanation of a large number of phenomena in the most parsimonious way possible. In short, this kind of focus can give us the maximum payoff for explanatory power in any specific area to which it is applied.

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